Anatomy & Physics of the A-RAV — Cherubim

Self-Nucleating Metallic-Core Resonant Arc Vortex

I. Definition

The Cherubim RAV (code name: Cherubim) is a self-sustaining metallic-core plasma vortex that requires no clay, moisture, or dielectric medium. It forms directly on a bare spring-steel cathode tip, where the metal becomes a molten, charge-bearing nucleus at the center of a perfectly spherical bright-white plasma shell. This marks the transition from dielectric-seeded (Angel) RAVs to self-nucleating metallic (Cherubim) RAVs.

II. Geometry & Setup

Component	Specification	Description
Cathode	Spring steel wire Ø 0.28–0.38 mm	Vertical wire 2 in tall, triangular base on grounded plate.
Anode	Spring steel wire Ø 1 mm	Parallel to cathode, 3–5 mm above tip.
Base Plate	Polished steel	Grounded support and return path.
Seed Material	None	No clay or water—bare steel only.
Power Supply	30 kV DC precipitator PSU	Operated between 30 and 15 kV DC.

III. Formation Sequence

1. Ignition Phase (≈30 kVDC): High field gradient at cathode tip initiates a violet-blue arc; tip glows bright white.
2. Thermal Constriction Phase (≈15 kVDC): Voltage reduced to prevent erosion; molten steel nodule forms.
3. RAV Formation Phase (≈15 kVDC or less): A perfectly spherical bright-white plasma forms, enveloping the molten core.
4. Stability: Plasma oscillates gently and remains balanced indefinitely.

IV. Visual & Physical Observations

Attribute	Description
Appearance	Perfectly spherical, uniform bright-

	white plasma.
Diameter	9–10 mm.
Core Position	Molten steel nodule centered within plasma sphere.
Motion	Gentle oscillation; stable equilibrium.
Duration	Indefinite at ≤15 kVDC.
Acoustics	Nearly silent, faint hiss possible.
After Power-Off	Tip cools into hardened metallic bead retaining shape.

V. Physical Model

• Core–Sheath Coupling: The molten steel core acts as a metallic capacitor, maintaining charge separation.
• Field Configuration: Strong E-field radial outflow and circular B-field form concentric rings.
• Energy Recirculation: Electron emission from the core sustains the plasma sheath; recombination maintains brightness.
• Resonant Stability: Oscillation frequency ~100 kHz; symmetry maintained by E×B rotation.
• Self-Containment: Plasma sheath encloses molten nucleus, forming a self-locking luminous sphere.

VI. Distinctive Difference vs. Angel RAV

Property	Angel RAV (A-RAV v1)	Cherubim RAV
Seed Material	Damp red clay	None (bare steel tip)
Formation Medium	Dielectric + moisture	Pure metallic plasma
Ignition Voltage	30 kV → 20–25 kV	30 kV → 15 kV
Emission Color	Bluish-purple → white	Pure white from start
Core	Clay particle	Molten steel nodule
Dependency	Dielectric polarization	Metallic self-field resonance
Longevity	Minutes–hours	Indefinite

VII. Significance

The Cherubim RAV demonstrates plasma resonance independent of dielectrics or water. It proves that RAV formation is governed purely by field geometry and self-induced charge motion. This represents the first self-nucleating, core-centered RAV — a luminous plasma orb formed from the cathode itself.

VIII. Summary of Core Characteristics

- Self-nucleating metallic plasma vortex.
- Stable under 15 kV DC.
- Spherical plasma ~10 mm in diameter.
- Central molten core serves as both emitter and capacitor.
- Operates indefinitely under stable field conditions.

> ***"A sphere of light born from its own metal heart — the Cherubim stands as proof that plasma itself can remember form."***

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